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ABSTRACT

There is clearly a need to develop strategies that will increase the likelihood that research on teaching will produce results that can and will be applied in the classroom. Problems resulting from the traditional theoretical structure for implementation of educational research arise from the isolation of its components and participants (research, development, dissemination, and adoption), lack of cost effectiveness, lack of communication, and time lags. Criteria for a new approach to educational research and its applications include: (1) Educational research should be available for widespread classroom application in a reasonably short time; (2) Research results should move directly to the classroom with minimal reliance on intermediate (training) products; (3) The research and development process should be interactive, with daily communication between participants; (4) Research on teaching and the corollary training of teachers should be concerned with the multiple dimensions of teaching; and (5) Research on teaching should emphasize the most effective forms of teaching. An Interactive Research and Development Model, proposed by the Far West Lab, brings together the teacher, researcher, developer, and the teacher trainer as an educational research and development consortium. This approach both researches the teaching-learning process and provides a process for the development of its constituents. (CJ)

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1

AN INTERACTIVE MODEL OF RESEARCH AND DEVELOPMENT IN TEACHING

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EFFECTIVE TEACHER EDUCATION PROGRAM

PROPOSED

AN INTERACTIVE MODEL[1] OF RESEARCH AND DEVELOPMENT IN TEACHING

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INTRODUCTION

Since its establishment in 1966, the Far West Laboratory for Educational Research and Development (FWL) has been committed to the improvement of teaching. While the emphasis has changed somewhat over the years--from development of research-based teacher training materials to the actual conduct of basic research itself--the Laboratory consistently has directed a major portion of its effort to identifying effective teaching behavior and to finding ways to apply it in the classroom.

In many respects, these efforts have been successful. Minicourses[2], for example, have proven to bring about changes in teacher performance in a variety of teaching skills. The Minicourses have been the focus of several dissemination/adaptation efforts here in the United States and Europe, e.g., the demonstration centers funded by the National Center for Educational Communication, the National Teacher Corps demonstration project, the Centre for Educational

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1. A previous version of this paper was circulated among several representatives of the constituency groups who would participate in this proposed model. Their critique is included in this paper. In addition, a preliminary proposal of the interactive model was presented by the authors as an example of applying research findings to teaching at the conference on Research on Teacher Effects: An Examination by Policy-Makers and Researchers, Austin, Texas, November, 1975.

2. "Minicourse" is the generic title for FWL products developed for teacher training. Each focuses on a teaching skill and consists of films or videotapes of model lessons, printed material for teacher consumption, and a practice, evaluation-feedback technique using microteaching.

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Research and Innovation, Organization for Economic Cooperation and Development, Paris, France transfer project.

In other respects, however, the FWL's programs in teaching have had much less impact upon teaching and learning than had been hoped.

Purchases and use of Minicourses have been below original expectations. The courses are used intensively and creatively in a few local education agencies and in a few institutions of higher education. However, it is eight years since research and development of Minicourses began, and they are used in less than ten percent of the school districts and/or teacher training institutions in the nation.

Further, basic research on teacher use of the specific skills in the Minicourses has demonstrated fewer effects on student performance than were anticipated and the aspects of teaching that have been related to student performance are major teaching strategies and/or combinations of skills used in particular sequences rather than the single skills emphasized in most of the courses (e.g., Gall, Meredith D., et al. "The Effects of Teacher Use of Questioning Techniques on Student Achievement and Attitudes," Volume I, Final Report, San Francisco: Far West Laboratory, August, 1975).

At the same time, the Laboratory's research into differences between more effective and less effective teachers has had promising results, (e.g., Tikunoff, W. J., et al. "Special Study A: An Ethnographic Study of the Forty Classrooms of the Beginning Teacher Evaluation Study Known Sample," San Francisco: Far West Laboratory, October, 1975).

The situation, thus is one in which recent research findings suggest several ways in which teaching could be improved. But the teacher training programs/products do not take this information into account.

The FWL is by no means unique in its findings. Indeed, the problem is pervasive in the entire educational research and development community.

The fact is that a great deal of educational research findings do not find their way into classrooms; and when they do, many are found to be out-of-date and/or irrelevant to the improvement of educational opportunities for the learner. Consequently, attention has begun to center on why this might be so, and on how the problem might be solved.

There is a clear need to develop strategies that will increase the likelihood that research on teaching will produce results that both can and will be applied in the classroom to improve educational opportunities for learners. This paper proposes such a strategy by discussing the research and development model that historically has served as the theoretical structure for educational research and the problems that have resulted from its use. Next, it suggests criteria for a new approach to educational research and to application of findings to teaching. Finally, an *Interactive R & D Model* is proposed which brings together the teacher, the researcher, the developer, and the teacher trainer as an educational research and development consortium in order to provide a new approach both to inquire into the teaching-learning process and to provide a process for instructional and professional development for the constituency of the consortium.

HISTORICAL PERSPECTIVE: How we got where we are and why the old r & d model hasn't worked.

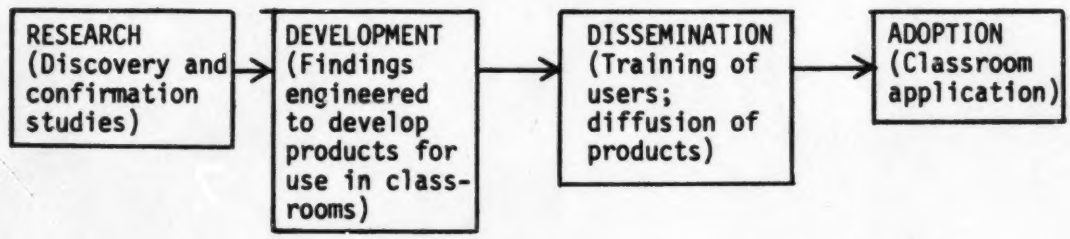
Modern educational r & d on a large basis exists as a direct result of Congressional reaction to the technological and sociological realities of the 50's and 60's. The National Defense Education Act of 1958 was the result of the sudden launching of Sputnik by the USSR and the realization that Soviet technology might be more advanced than our own. It was then the hope that massive federal spending in the nation's public schools would somehow improve educational opportunities so that we could "catch

up." Similarly, the 1960's produced the societal dissatisfaction of the poverty-stricken and racial and ethnic minority peoples, and Congress reacted by producing legislation designed to solve domestic problems. Among these was the Elementary and Secondary Education Act of 1965.

It was perhaps a natural outgrowth of their experience with the technological perspective of "catching up" with the Soviets that led federal governmental planners to perceive of educational research, development of products, dissemination of these products, and their eventual adoption by schools as a linear, "goods"-oriented process. The model of planned innovation advocated by Clark and Guba (1965) became the basis for educational r & d and grew directly from such technological thinking. Clark and Guba's model was linear, providing for discreet functions at each step and a "natural" lock-step process for getting from research findings to their implementation in the classroom (see Figure 1).

FIGURE 1

Linear Educational R & D Cycle
(based on Clark and Guba, 1965)


RESEARCH (Discovery and confirmation studies)
DEVELOPMENT (Findings engineered to develop products for use in class-rooms)
DISSEMINATION (Training of users; diffusion of products)
ADOPTION (Classroom application)

In this model, the researchers are responsible primarily for conducting the research and for producing findings. Developers utilize research findings to develop and produce products which can be used by students, by

teachers, by teacher trainers, etc. Dissemination and diffusion of both research findings and products is the next step in the process. Finally, the adoption of the results of educational r & d by educational institutions completes the process.

It is now apparent, some eleven years and millions of dollars later, that the linear r & d model has not worked for several reasons.

First, as noted by House (1975), the initial objectives of government planners of educational r & d were heavily influenced by the principle of cost-effectiveness. Thus, the simplistic, technological approach to solving educational problems perhaps seemed to be the cheapest. In light of its failure the approach has proven otherwise. We now know better than to assume sophisticated, multi-media hardware and software can be easily mass produced and disseminated, thereby resulting automatically and predictably in large-scale innovations in the schools.

Indeed, the educational system differs markedly from a technological system (Berman, et al., 1975). There is no single marketplace where one can choose to buy one thing or another in order to solve an educational problem, take it to a school, plug it in, and sit back and watch it work its miracles. It was this inability of planners to recognize that educational innovations had to be adapted by various people, e.g., teachers, students, parents, to meet the differing needs of various places that proved most faulty.

In fact, Clark and Guba (1974), in reviewing the results of their earlier proposed r & d model, have criticized the federal government more succinctly. They charge the government with:

1. establishing unachieveable aspirations;
2. ignoring the goals of individual knowledge production and utilization (KPU) practitioners and individual KPU agencies in the total educational KPU community;

3. changing signals persistently (and frequently) in attempts to overcome evaulative failures; and finally,
4. overcontrolling and overcentralizing programs which have been disappointing.

A *second* reason for the failure of the linear r & d model is the assumption that a passive consumer is at the end of the chain, waiting with open arms to receive the "Magic Pill" that will suddenly result in increased educational opportunities (Havelock, 1971). Instead,

> "Teachers, the ultimate consumer, seem to be more influenced by factors in their immediate surroundings than by impressions of innovations or impersonal knowledge about them." (House, 1975)

Thus, both teachers and schools tend to pursue their own goals, and these are not necessarily related to the goals of educational r & d which may, or may not, build from the concerns of the ultimate users of the r & d products. A result of this perception of the consumer as a passive rather than an active participant in the r & d process is the undermining of the self-confidence of teachers such that they are suspicious of educational researchers who "tend generally to 'work around'" them and avoid their participation (Chall, 1975).

An additional oversight is the failure to recognize the reality of the school as a culture. Griffin (1975) points out that the school culture is essentially a closed culture, "...closed to its counterparts and certainly closed to products, processes, and persons not directly aligned with it in an organizational fashion." A teacher works more often in isolation than in concert with others. In such a situation it cannot be assumed that innovations can automatically be operationalized.

A *third* problem with the linear r & d model is that the move from initial design of research to final dissemination of results to classroom teachers has taken too long. Minicourse 1: Effective Questioning--Elementary Level, is a typical example. Stanford University's basic

research on microteaching was begun in 1963. The FWL began developing Minicourse 1 in 1967. The course applied the results of the microteaching research to a delivery system for training and used other research on higher cognitive thinking and questioning techniques to specify the teaching skills to be included in the course. Development and testing consumed another three years, with the final product released for general use by classroom teachers in 1970. In total, seven to eight years elapsed from the beginning of Stanford's research to the general availability of Minicourse 1 for use in improving inservice teaching. Compound this time lag with the added slowness of the dissemination process at the end of the seven to eight year r & d effort, and the disillusionment with educational research and development that exists today is not surprising.

Isolation of the four component functions of the linear r & d model--particularly the separation of researchers and teachers by the imposed intermediary functions of development and dissemination--has produced linguistic barriers. These barriers represent the *fourth* problem with the linear model. Teachers tend to talk to teachers, and researchers tend to talk to researchers, but seldom do they talk to each other. An imposed isolation seems to exist even in the nature of professional organizations and their conferences. The result is that the language used by educational researchers to describe their findings is largely uninterpretable by teachers who are unfamiliar with research terminology, most of which originates from the discipline of psychology and is statistical in nature. A parallel situation could be drawn by the scenario of a medical doctor using medical terminology to describe a problem to a patient, except that a doctor must talk with his patients, while researchers and teachers are not compelled to talk to each other.

Teachers complain that researchers do not use language they can understand, while researchers assert that their role is to produce research findings and not to interpret them. A result, of course, is the failure of such findings to be applied by teachers in order to increase educational opportunities in the classroom.

In summary, it is clear that the linear r & d model does not work in education. It is also apparent that a new model for educational r & d needs to be developed which attends to solving some of the shortcomings of the old model. To this end, some criteria for establishing such a model are presented next.

CRITERIA FOR A NEW R&D MODEL IN TEACHING: What should we do and who should do it?

Several important considerations for developing a new r & d model have emerged from the frustration of educational researchers who have worked with the linear r & d model and found it to be lacking. These include:

1. The results of educational research should be available for widespread classroom application within a reasonably short time frame.

The time lag between the inception of research and its utilization in the classroom is currently too great. Problems confronting schools today are of an immediate nature and cannot wait the eight to ten years it has taken to research a problem, develop a solution, and disseminate that solution so that it may be adopted in the schools.

Further, burgeoning problems associated with urbanization and the increasing militancy of teachers' organizations are producing growing pressure to identify solutions. There is every indication that these pressures will not diminish, and that they will be felt even more urgently by Congress.

2. The delivery system for disseminating research results should move directly from research to the classroom with minimal reliance upon intermediate (training) products.

During the past nine to ten years, products have been recognized as the major vehicle for disseminating research findings. Whether in the form of curricular materials, FWL Minicourses and other teacher training materials, journal articles, etc., products have at least five flaws as a medium for delivering educational research to classroom teachers.

Product development requires substantial time and money. While not necessarily a conclusive limitation of itself, the magnitude of investment necessitated by product development raises the question of whether there might not be alternatives.

Products are static. They inevitably reflect the state of knowledge at a given point of time and can be changed to reflect new research findings only by a prolonged and expensive process. And, as Ovsiew (1974) suggests, if creative imagination on the part of the practitioner delineates need and invention precedes research, the practitioner may not want the product as it was originally constructed once it is finally available. Therefore, whatever means is developed for implementing new knowledge into classrom practice, it should be flexible and adaptive. In addition, such means should be responsive to both individual as well as institutional goals, and should realistically reflect the real world of the educational process (Clark and Guba, 1974).

Rarely does a product reflect the goals of a single school or an individual teacher yet only when this is so can one reliably depend upon continued practice of an innovation. In an evaluation of federally funded projects, the Rand Corporation found that the closer the goals of a given

program were to those of a school district, the more likely it was that the program would be continued once federal monies were discontinued (Berman, et al., 1975). Unless products can be developed that are immediately responsive to specific situations, they would seem to be superfluous at best.

Many extremely significant research findings simply do not require an elaborate product for dissemination if there were an effective alternative procedure for making such findings accessible to classroom teachers. For example, research on teaching suggests teachers spend more time with high performing than with low performing students (Rist, 1970). Do we need an expensive product for a teacher to determine if instructional time is allocated appropriately? Is a product necessarily the best way to change teacher use of instructional time?

The use of products as the primary delivery and training system rests on a remarkably untenable assumption: that producing a product will be sufficient to achieve classroom application of research. Despite the dissemination efforts of publishers, teacher organizations, school districts, governmental units, and research and development agencies, teacher access to products is at best limited. And even when access is available, products are impersonal. They cannot provide individualized training within the context of a teacher's specific situation, and they do not offer feedback from another person. Even in the Minicourse format, which was intended to be self-instructional, teachers have requested the opportunity to interact with someone more expert than themselves in applying and evaluating their use of the specified skills.

A major effort should be devoted to developing and testing alternative systems for delivering research to classroom teachers. These systems should recognize the role of the teacher as the one responsible for personal,

professional development, as well as for the various levels of expertise that are already possessed by teachers.

3. The r & d process should be an interactive one, and should include daily, ongoing communication between teachers, researchers, trainers of teachers, and others involved in the process.

Only when the individual expertise of teachers, researchers, teacher trainers, and others is jointly applied to solving educational problems is full use made of the available resources. When such a concerted effort takes place the potential is increased.

In addition, each person involved in such an ongoing process gains from the experience even while contributing to the effect on the others. Teachers, for instance, gain greater insight into their teaching when they are deeply engrossed--investigating, inquiring, and experimenting--in collaboration with other teachers and researchers (Chall, 1975). In fact, Goodlad and Klein (1970) infer that innovations occur only when teachers are involved in the process of seeking solutions to their own problems. This involvement can insure greater consonance of teachers' objectives and values with those being researched, and it is this feature for which Berman (1975) predicted greatest success in his evaluation of federally funded programs.

Trainers gain greatly from such interaction as well. Development of training strategies as an entirely separate process following completion of research contributes to the time lag in achieving classroom application. Equally significant, it isolates researchers and trainers from each other. As a result, trainers generally have no knowledge of what teachers need to learn (or unlearn) in order to apply the research findings.

When researchers are constantly interacting with teachers, a great

deal can be learned early in the inquiry process and the result can be more completely formulated research questions. For instance, researchers are often accused of asking questions the answers to which are not as immediately useful or important as others a teacher might want to pursue. Additionally, input from teachers during the formulation of the questions might alter the assumptions about teaching and learning upon which the the research would be based. The nature of such collaboration, therefore, might result in the saving of both time and money and/or the expansion of the payoff from the research.

Ultimately, bringing together teachers, teacher trainers, developers and researchers--the separate pieces of the knowledge production and utilization system under the linear r & d model--would result in what Clark and Guba (1974) label a community "concerned with and functioning in educational knowledge production." Building on the community-sense, they believe, is more likely to produce the ultimate utilization of knowledge.

4. Research on teaching and the corollary training of teachers should be concerned with the multiple dimensions of the teaching act, emphasizing the context within which teaching occurs.

Both the content of research and the application of findings to teaching have tended to isolate specific elements of teaching behavior. While this is highly convenient for the researcher, it usually produces results that have limited validity and limited applicability in real classrooms.

One segment of research, for example, has emphasized effective questioning techniques as a means of developing the higher cognitive process. FWL's Minicourse 1 built upon these findings to train teachers in questioning techniques. Questioning, however, occurs within a context of students and their needs and learning styles, instructional goals, and the total sum

of activities occurring at a given time. If research and training ignore this context, what may appear to be "effective" questioning in isolation can be highly ineffective in the real setting of classroom application.

The appropriateness of the teaching act within a given context, rather than the number of times that act occurs, appears to be the more meaningful measure of teacher effectiveness.

While research and training that attend to multiple dimensions of teaching are exceedingly complex, it appears that this is the direction in which we should be moving. This opinion is supported by several well-known researchers on teaching such as Brophy (1975), Stallings (1975), and McDonald (1975). To do such research requires the input and participation of the teacher.

5. Research on teaching should emphasize the most effective forms of teaching.

Up to now, research on teaching has tended to follow one of two paths:

- Collecting and analyzing information about teaching from a cross sample of teachers--thereby looking at many mediocre teachers, many average teachers, and perhaps a few effective teachers.

  Using standard statistical procedures, i.e., mean scores for all teachers, such research has identified few, if any, effective teaching strategies.

- Testing what is hypothesized to be a highly effective teaching strategy in an artificial (experimentally manipulated) situation which, even if successful, fails to discover whether the strategy actually is appropriate to the general instructional setting.

Instead, it is proposed that research should:

- Seek to identify highly effective teaching in its multiple context by analyzing the important features of such teaching prior to the initiation of the research. Then identify for study teachers who possess the desired skills and characteristics and are able to apply them; rather than using a cross sample where few, if any, teachers may exhibit the desired skills. The Known Sample for BTES Phase III-A is one approach to this form of sample selection (Berliner and Ward, 1974). Other ways for obtaining "known samples" should be explored, particularly

procedures that consider multiple dimensions of teaching and learning simultaneously.

- Test the application of teaching strategies hypothesized as effective in realistic (not artificial) contexts. By this we mean that the research should attend to the multiple dimensions of effective teaching and not, for experimental purposes, manipulate the use of teaching skills such that the treatment to be studied would be judged "poor" teaching by the users of the research (teachers and teacher trainers).

PROPOSED: An Interactive Model for Research, Development and Training in Teaching

Consistent with the foregoing five criteria and growing from the obvious inadequacies of the *status quo*, we propose an *Interactive Model for Research, Development and Training in Teaching*. The process described here grows out of our experience with research on teacher effectiveness. Because we believe that educational opportunities for the learner can best be brought about by focusing on the teaching-learning process, the model involves the teacher as an integral decision maker and supports his/her interests in professional development.

The proposed model is outlined here in two sections. First, the model and participant roles are described. Then, criteria for successful implementation of the model are suggested.

The Interactive Model and Participant Roles

As noted earlier, the research and development cycle in education has been linear (see Figure 1). The steps in the process have been given various labels by various theorists and users as noted in the figure, but the same general assumption has underscored the model--that one step should be completed before the next step is begun.

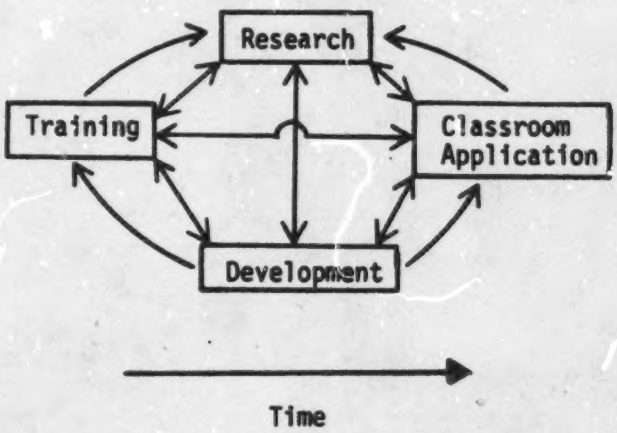
We have shown how, in this linear research cycle, researchers, teacher trainers, and classroom teachers largely have operated independently; the

researchers have conducted their studies with very little interaction with trainers and teachers, most often only as absolutely necessary to conduct a study. Trainers and teachers in turn have seldom provided feedback to the researchers regarding the relevance and applicability of their methodology and findings.

Instead, it is proposed that an interactive research, development, training, application model be developed and tested (see Figure 2).

FIGURE 2

Interactive Model of Research, Development, and Training in Teaching



In this new approach, the research has built into it a concern for training requirements, stemming from research techniques and research findings, and for classroom reality, as shown by the two-way arrows in Figure 2.

The research team is composed of not only researchers, but also trainers, developers, and classroom teachers themselves. All participate in decisions regarding what should be studied and how it should be studied.

Once this decision is reached, the researchers proceed to conduct the study, while the teachers undertake informal and participant observation studies of the extent to which they and others are already utilizing those aspects of teaching on which the research is focused, including both positive and negative aspects. Concurrently, the trainers and developers examine the data collection procedures used in the research to establish ways of applying these same procedures in training, conduct small-scale pilot tests of some of these applications, and hypothesize possible outcomes of the research with resultant implications for training.

When such an interactive research and development effort is in effect, educational institutions must work together. No single institution can carry out the research if application of the results and use by both inservice and preservice teachers is the ultimate goal. At a minimum, individuals from a school (or school district) and an institution of higher education must work together. Preferably the team would include representatives of the schools, institutions of higher education, and other educational r & d agencies. The critical factor is to combine the in-class experience and r & d expertise needed to resolve a particular educational problem.

The content of the research on teaching to be undertaken in the testing of the proposed model, i.e., the questions to be investigated, is, for the most part, open for consideration and dependent upon decisions made by the team. These questions, therefore, would grow directly out of the needs and concerns of the on-site participants. This is a paramount departure from the linear r & d model in which such decisions were made by persons removed from the teachers and trainers. In fact, these decisions often were made before researchers began their work, by governmental planners followed by a competitive process of responding, by the researchers, to an RFP (Request for Proposal).

Several important factors that must be considered as the team selects the areas of teaching to be studied include:

- Teaching does not occur as a separate activity. The purpose of teaching is learning on the part of students. Therefore, any study of teaching must take into account learning and thus the actions and characteristics of the learners as well as the teacher(s).

- Teaching and learning are not content free. If one is to be concerned about the multiple dimensions of teaching (and learning) the content of what is to be learned (and taught) must be considered.

- Within the interactive model the applicability of the aspect of teaching to be studied to regular classroom instruction should be considered from the earliest stages of discussion. Realistic and functional teaching events should be the focus of the research.

The research methodology to be utilized in the proposed model should move beyond that traditionally applied in educational-psychology based research. This is not to say that the "traditional" methods of educational research would not be used, but that additional promising approaches also would be considered. Application of ethnographic procedures to the study of teaching is one example of a non-psychology-oriented approach that has high potential for accommodating multi-dimensional, realistic studies of teaching.

Further, the research methodology used by the team should consider new avenues for collecting information about teaching--avenues that ethnographic procedures make it feasible to explore. In particular, the use of the teacher as a contributor to basic knowledge about teaching--in other words as a researcher--while still maintaining his/her teaching role needs to be tested. Such a function for the teacher is, in fact, essential to the interactive r & d model. For instance, a teacher might prepare ethnographic protocols identifying the teaching-learning events that occurred, i.e., the types of students who were involved and the content that was learned whenever an instructional lesson was particularly successful. These protocols,

then, could be compiled as a source of information about what aspects of teaching warranted further study. Another ethnographic function of the teacher might be to conduct self-observation or observations of peers to determine whether the dependent and independent variables proposed for a research study were realistic.

Some Criteria for Implementation of the Model

If such an interactive r & d model is to succeed, a great deal of its success will rest upon the people who participate and the processes utilized to put it into operation. In order to establish criteria for best implementing the model, we circulated a draft narrative of this paper to eight independent participants in the knowledge utilization and production community.[3] They included two who are currently teaching, although all eight have previous classroom experience at the elementary or secondary level; one director of inservice education in a metropolitan school district; a superintendent of a K-8, urban-fringe school district; a director of teacher training and two additional members of teacher education faculties; and one person with a broad research background currently affiliated with a national teacher's organization. Such a group, we felt, represented national interests as well as the specific interests of exemplary constituent members of a team operationalizing the proposed model.

Their task was to critique our preliminary ideas and to establish some criteria that might serve as guidelines for implementing the model. This section reports their suggestions. Criteria appear in the order of importance determined by the number of times each was mentioned by a reviewer. Wherever feasible and important to the discussion, excerpts of

3. A list of the reviewers and their respective positions appears as Appendix A to this paper. In the following discussion, their last names are cited to denote a contribution.

reviewer's comments are included.

1. Selection of team members

It is clear that the participants in an interactive process, such as the one proposed, are integral to its success. Thus, the selection of participants is an important criterion, and was cited by seven reviewers as critical to the implementation of the model. Their concern and subsequent advice is thus seemingly of paramount importance.

A selection process sometimes infers an election. If such is the case, there is a danger that those "elected" might not represent the needs and interests of peers (Tevlin). Reviewers suggested instead that an ideal situation is one in which participants volunteer to work on such a team, and that rationale, objectives and tentative procedures be worked out at an initial planning meeting, thus allowing for early withdrawal of any who might wish to do so (Griffin).

Particularly in the instance of teachers, such volunteering is necessary. Already faced with an overloaded day, some teachers might not want to participate. Too, volunteering is indicative of a desire to change, and those teachers who want to change are more likely to learn from the experience and to grow (Thomas).

To be successful, it would appear that the composition of such a team must reflect a spirit of willingness to cooperate and a desire to work together. To insure this, a selection process which is both flexible and equitable should be utilized. Because circumstances will vary with sites, this could mean that the process will differ among sites.

2. Released time for teachers

If teachers are to participate actively and daily with the team, a plan will have to be devised that will allow them to be available for such

participation. Because of the nature of their responsibilities, this necessarily means some time away from their classrooms. Without this time for planning, for observing, for identifying and assessing and for training, teacher participation could be only minimal at best (Fitch). Five of the eight reviewers felt strongly about this.

Solutions were suggested and these may work depending on the characteristics of a specific site. A half-time assignment, where the teacher spends a part of the day in the classroom and a part of the day in other activities, is one arrangement (Thomas). This arrangement would be easier to facilitate at a larger school because of the availability of additional supervisory help, e.g., vice-principals, counselors, etc. (Courter).

The problem of releasing teachers from teaching time in order to focus on activities of the r & d team is essentially a problem of alternative human resources. One source that has worked well is utilizing teachers-in-training at a nearby teacher training institution to teach part of a school day. The advantage here is to both the student teacher and to the classroom teacher: the student teacher fulfills the requirements of a practice teaching experience under the guidance of an outstanding teacher, while the teacher is freed for portions of the day to do other planning (Tevlin, Fitch). An additional source of such manpower rests in the hands of the principal (McKenna) and the superintendent (Symons). Their active involvement in activities of this nature leads to support, including the commitment of personnel and time.

Each site will offer unique resources as well as differing problems in this respect. Thus, solutions will depend greatly upon the creativity of the team in providing solutions. One sensitivity concerning manpower expressed by the reviewers is that of cost effectiveness, i.e., the monetary support of additional personnel by sources outside the normal budget during

a project's operation has often been withdrawn at its completion (Fitch, Courter). Ways must therefore be developed to insure teachers' participation without applying undue stress on a school's operating budget.

3. Incentives to enlist teacher participation

Increasingly, teachers are being asked to assume a broad range of activities and responsibilities for which neither time nor monetary remuneration is provided (McKenna). Consequently, teachers have become more and more reluctant to volunteer responsibilities which take them away from their teaching and their classrooms. When they do volunteer, the same teachers seem to be involved consistently in leadership projects such that little time is available (Thomas, McKenna). Clearly, if teachers are expected to participate, the incentive to do so must be provided.

As authors of the proposed new educational r & d model, we naturally hope that the product of such a collaboration is sufficient incentive. However, we also recognize the realitiies of time constraints and the American system of reward, monetary and otherwise. As with the previous two criteria, the solution to this one will rely heavily on individual site characteristics and creativity of the participants.

Reviewers proposed a variety of incentives that have worked in the past: college course credit, additional salary increments, reduction of contracted responsibilities, sabbatical leave, promise of promotion (Courter), etc. Each would be dependent on local site characteristics, however.

4. Inclusion of others on the r & d team

As discussed in this paper, the team which would operationalize the proposed, new interactive r & d process would be composed of teachers, teacher trainers, developers, and researchers. This constituency is

representative of the educational knowledge production and utilization community. The reviewers, however, felt that others ought to be considered as possible participants.

The national move toward decentralization of school district functions has elevated the principal to a position of considerable responsibility. Thus, increasingly more decisions about assignment of personnel, support of programs, and budget are being made at this level. It would therefore appear that the principal's participation is an important consideration (Symons). This is particularly true in light of the research that indicates that while principals are not often leaders in innovations, they can block an innovation if their support is not obtained (McKenna).

Another national trend is parental involvement in educational decision-making. Parents can provide positive, supportive assets (Symons), and parents or school advisory groups should somehow be involved (Fitch).

5. Parity in decision-making

The process of decision-making is always critical when people are asked to cooperate in order to achieve common goals, and inherent in this is the issue of parity.

Two underlying philosophical points support the thinking that produced the new interactive r & d process. The first is that no single person is imbued with all knowledge and skill, and that there is much to be gained by drawing on the specific expertise of individuals rather than developing that expertise in oneself. By putting together on a team people with functional experience in teaching, in teacher training, in development, and in research we had hoped to draw on this principle by utilizing the expertise of each individual.

Given that each person on a team brings a particular, needed expertise

and assumes equal responsibility for working toward the fruition of mutually agreed-upon goals, then each member of such a team ought to have equal decision-making power. Of course, the notion of working together in a cooperative relationship infers that each team member recognizes his/her own expertise as well as that of every other member, and both draws and relies on others.

Reviewers expressed concern that such a decision-making process be in existence (Griffin), and that teachers and others share equal parity in that process (Thomas, Cooper, Griffin). In fact, a site that demonstrated success in utilizing such a process might provide more opportunity for implementing the new r & d process (Griffin).

APPENDIX A

Representative Reviews of this Proposal

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